ABSTRACT

Second IAA International Conference on Low-Cost Planetary Missions

Donna L. Shirley
Manager, Mars Exploration Program
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, Ca 91109
Fax 818-393-6800
E-Mail: dshirley@ccmail.jpl.nasa.gov

"Mars On $300K A Day! The Mars Exploration Program

The Mars Exploration Program will continue the exploration of the red planet by robotic spacecraft which began in 1965. The new U.S. program of exploration will begin with launches in late 1996 of the Mars Global Surveyor and Ma - Pathfinder missions and extend through at least 2005 (the duration of the Mars Surveyor Program). And studies are underway for activities leading up to a human mission to Mars as early as 2018. The focus of the first 10 years of the Mars Exploration Program is on building up knowledge steadily and incrementally to a thorough characterization of the planet in terms of Life, Climate, and Resources.

Mars Pathfinder will be the second mission in the Discovery Program of planetary exploration. It will launch in December 1996 on a McDonnell Douglas Delta II rocket, and land on July 4,1997. It will image the terrain in 12 different spectra, monitor the weather, anti deploy a small rover to explore the region around the lander and measure the composition of the surface.

Mars Global Surveyor, which will launch in December 1996 (also on a Delta II), will go into orbit around Mars in September 1997 and, after aerobraking into a circular polar orbit, will scan the surface of Mars for a full Martian year (about two earth years) using **6 of** the **8** instruments that were originally flown on Mars Observer (which was lost in 1993- the first planetary spacecraft failure in 27 years).

Mars Global Surveyor is the first mission in the Mars Surveyor Program. This program will fly two missions to Mars every opportunity (about every 26 months), and, with Pathfinder, is pioneering the "better, faster, cheaper" approach to planetary missions. In late 1998 Mars Surveyor 98 will launch an orbiter and a lander on a Delta 7325 "Med-lite" launch vehicle (at a considerable savings over a Delta II). The orbiter will carry an infrared spectrometer to survey the atmosphere over a yearly cycle. The lander will carry a payload focused on the search for volatile elements such as water.

The final element of the lost Mars Observer payload (a gamma ray spectrometer) will search for water in 2001 on the Mars Surveyor 01 orbiter, and another landed payload will continue the search for volatiles. The 2001 mission may be conducted in partnership with the Russians. In 2003 the Mars Surveyor program is exploring a partnership (Intermarsnet 03) with the European Space Agency to place 3 or 4 landers on the surface. And the Mars Surveyor 05 mission may prepare to return a sample from the Martian surface.

Over the next ten years the Mars Exploration Program will result in a detailed understanding of Mars, which is of interest not only to scientists but to understanding more about the earth's environment, and eventually, for future human exploration. The entire program will be conducted for about one-third the cost of the Viking missions which orbited and landed on Mars twenty years ago. Each mission costs about the same as a major motion picture, and the total cost of 10 missions to Mars is about that of a single major military aircraft.